oped forms. WILLIS had concluded that species are *not* dying out. In conclusion, SINNOTT emphasizes the complexity of the problem and points out the many factors involved. The complexity of a problem, however, should justify rather than discourage the development of such a theory.—MERLE C. COULTER.

Free ammonia and ammonium salts in plants.—WEEVERS[17] has made a large number of determinations for free ammonia and ammonium salts in tissues of various members of the plant kingdom. Tests for ammonium salts were made as follows: a portion of the plant material (25 mg.) along with a drop of water was placed in the bottom of a collared microscope slide. Some powdered magnesia and a wad of cotton bearing a little chloroform were added. A cover glass bearing a hanging drop of platinic chloride was then placed on the collar. The chloroform killed and rendered the cells permeable, while the magnesium oxide liberated the ammonia from the ammonium salt of the tissues. The ammonia was detected by the $(NH_4)_2Pt\ Cl_6$ crystals in the hanging drop. For the detection of free ammonia only the tissue or the tissue and the chloroform were added along with the hanging drop. Sodium hydrate (20 per cent) could be substituted for magnesia only in case the reaction was rapid, for the former liberates ammonia from amides in a few hours at room temperature. WEEVERS believes he could estimate closely the relative amount of ammonium salts in various tissues by the amount of $(NH_4)_2Pt\ Cl_6$ crystals formed. His estimates tallied with the quantitative determinations that were made in many cases.

Among phanerogams free ammonia was found only in bacterial nodules. In cryptogams it was occasionally found in Hymenomycetes and lichens. Ammonium salts were found in all species examined except in some mycotropic and insectivorous forms naturally growing on acid moorlands poor in ammonium salts. Their absence in these forms is apparently related to the nature of their protein metabolism and not to nitrogen shortage in the soil, as indicated by their behavior in water cultures and by other plants of the same habitat bearing ammonium salts. The amount of ammonium salts present in the leaves of any plant is apparently independent of their presence in the soil. Ammonium salts that are absorbed by the roots from water cultures are quickly transformed and do not influence the amount in the leaves. Many facts indicate that these salts result from protein metabolism, assimilation, and dissimilation. The more vigorous metabolism in any part the more ammonium salts are present. Some plants and plant parts are rather rich in ammonium salts, bearing as much as 2 per cent; certain sea forms (*Noctiluca miliaris*); many hymenomycetes and lichens (excepting lichens on moorlands); certain Liliaceae and Cruciferae (onion and cabbage roots), and root nodules of

[17] WEEVERS, TH., Das Vorkommen des Ammoniaks und der Ammonsalze an den Pflanzen. Rec. Trav. Bot. Neerland. 13:63–104. 1916.

Papilionaceae. The author believes that certain of the mycotropic forms are limited to acid soils because of the use, through the help of their mycorrhiza, of organic nitrogen compounds, and these are most abundant in absence of lime. —WM. CROCKER.

Hybrids of maize.—COLLINS[18] makes a contribution to the genetics of maize by reporting results from his studies of hybrids between pod corn and a type discovered by Dr. W. B. GERNERT, in which the pistillate inflorescence is replaced by a compound inflorescence branched as is ordinarily the case with the tassel.

In his experiments the progeny of ordinary *tunicata* plants has always consisted of approximately 3 tunicates to 1 normal. In other words, the usual tunicate ear is a heterozygous dominant. The homozygous dominant is apparently a type which makes up about one-third of the total number of tunicate plants and is characterized by greatly enlarged tassels containing both staminate and pistillate flowers, and the ear either with enlarged sterile spikelets or wanting. *Zea ramosa*, on the other hand, is recessive to normal.

In 1914 a cross was made between half-tunicate (heterozygous) ♂ and *Zea ramosa* ♀. Of 9 first generation plants, 4 were tunicate and 5 normal, the tunicate ears being "half-tunicate" and showing no trace of *ramosa* characters. From 2 selfed F_1 non-tunicate ears 85 plants were raised, of which 65 were normal and 17 *ramosa*. From 3 selfed F_1 half-tunicate ears 326 plants matured. Among the *tunicata* plants of this lot there were both *tunicata* and *ramosa* tassels, and in the latter a new type appeared which had indeterminately branched inflorescences embryonic in nature. This peculiar type (termed cauliflower) occurred in both lateral and terminal inflorescences, although more common in the former. A simple Mendelian interpretation of these results is given.—E. M. EAST.

A New Zealand biological station.—Canterbury College has recently set apart a tract of land in the mountainous center of South Island, New Zealand, and provided it with buildings suitable for a biological station. It is situated at an altitude of 1850 ft. on the Cass River and is surrounded by mountains, some of which are over 5000 ft. high. Descriptions of its situation,[19] its physiography,[20] and its vegetation[21] seem to show that it is well suited to the purpose for which it was intended. The vegetation displays a wide

[18] COLLINS, G. N., Hybrids of *Zea ramosa* and *Z. tunicata*. Jour. Agric. Research **9**:383–395. *pls. 13–21.*

[19] CHILTON, CHAS., Introduction and general description of station. Trans. New Zealand Inst. **47**:331–335. 1915.

[20] SPEIGHT, R., The physiography of the Cass district. *Ibid*. **48**:145–153. 1916.

[21] COCKAYNE, L., The principal plant associations in the immediate vicinity of the station. *Ibid*. **48**:166–186. 1916.